

**NOTE TO PTO PERSONNEL:**  
**THIS PATENT APPLICATION IS BEING**  
**FILED WITH SMALL ENTITY STATUS**

1                   **OPERATING DEVICE FOR A SCREWDRIVER**

2                   **CROSS-REFERNECE TO RELATED APPLICATION**

3                   This application is a Continuation-In-Part Application of Serial  
4                   No. 10/226,270, filed August 23, 2002, and entitled "OPERATING  
5                   DEVICE FOR A SCREWDRIVER", now pending.

6                   **BACKGROUND OF THE INVENTION**

7                   1. Field of the Invention

8                   The present invention relates to an operating device, and more  
9                   particularly to an operating device for a screwdriver.

10                  2. Description of Related Art

11                  A conventional operating device for a screwdriver in  
12                  accordance with the prior art shown in Fig. 7 comprises a pivot seat (50)  
13                  having two channels (51) defined and extending into the pivot seat (50)  
14                  from the outer periphery of the pivot seat (50). The two channels (51)  
15                  are parallel to each other. Two pawls (51) each is reciprocally received  
16                  in a corresponding one of the two channels (51) and partially extending  
17                  out of the pivot seat (50). An adjusting ring (60) is pivotally mounted  
18                  around the pivot seat (50). The adjusting ring (60) has two grooves (61)  
19                  longitudinally defined in an inner periphery of the adjusting ring (60)  
20                  and a guiding portion (62) formed on the inner periphery of the  
21                  adjusting ring (60) between the two grooves (61) of the adjusting ring  
22                  (60). The two grooves (61) are provided to selectively receive a distal  
23                  end of a corresponding one of the two pawls (51) to change the

1     operated direction of the screwdriver.

2             However, the pivot seat (50) has no enough space to centrally  
3     define a through hole to receive a long tip because the pivot seat (50)  
4     has two channels (51) defined therein such that the conventional  
5     screwdriver is in a narrow-range.

6             With reference to Fig. 8, another ratchet screwdriver is shown.  
7     The ratchet screwdriver includes a handle (not numbered) and an  
8     operating device (80) mounted in and near a bottom of the handle. A  
9     barrel (70) is rotatably and centrally received in the handle. The  
10    operating device (80) is connected with the barrel (70) for selectively  
11    driving the barrel (70). A switch (90) is mounted in the operating  
12    device (80) and partially extending through the handle for user to  
13    change the operated direction of the operating device (80). The  
14    conventional screwdriver can be used with a long tip because the  
15    operating device is mounted near the bottom of the handle and the  
16    barrel (70) extends to the operating device (80).

17            However, to mount the operating device (80) near the bottom of  
18    the handle for using with a long tip is an inconvenient design. The user  
19    must move the screwdriver from one hand to another for adjusting the  
20    switch (90) to change the operated direction of the screwdriver.

21            The present invention has arisen to mitigate and/or obviate the  
22    disadvantages of the two conventional screwdrivers.

23    SUMMARY OF THE INVENTION

1           The main objective of the present invention is to provide an  
2 improved operating device for a screwdriver that can be used with a  
3 long tip.

4           To achieve the objective, the operating device in accordance  
5 with the present invention comprises a body including a through hole  
6 longitudinally and centrally defined in the body. The through hole has  
7 an enlarged portion formed in one end of the body. A first channel is  
8 defined in the body and corresponds to the enlarged portion of the  
9 through hole. The first channel communicates with the enlarged portion  
10 of the through hole. A second channel is defined in the body. The  
11 second channel corresponds to the first channel and the enlarged  
12 portion of the through hole. The second channel communicates with  
13 the enlarged portion of the through hole. A barrel is partially and  
14 pivotally received in the first through hole in the body. The barrel  
15 includes a polygonal hole therein and centrally extending through the  
16 barrel for receiving a long tip. A series of teeth is formed on an outer  
17 periphery of the barrel and corresponds to the enlarged portion of the  
18 through hole. A controller is pivotally mounted on the body for  
19 controlling an operate direction of the screwdriver. The controller  
20 includes a first pawl movably received in the first channel in the body  
21 and selectively engaged to the series of teeth of the barrel to control the  
22 operate direction of the screwdriver. The first pawl extends over the  
23 body and has a first guide side formed on a free end of the first pawl. A

1 first resilient member is mounted in the first channel and abuts against  
2 the first pawl to push the first pawl toward the series of teeth of the  
3 barrel. A second pawl is movably received in the second channel in the  
4 body and is selectively engaged to the series of teeth of the barrel to  
5 control the operate direction of the screwdriver. The second pawl  
6 extends over the body and has a second guide side formed on a free  
7 end of the second pawl. A second resilient member is mounted in the  
8 second channel and abuts against the second pawl to push the second  
9 pawl toward the series of teeth of the barrel. A cover is pivotally  
10 mounted to the body for driving the first pawl and the second pawl to  
11 control the operate direction of the screwdriver. The cover has a clutch  
12 attached to the cover. The clutch has a first side corresponding to the  
13 first guide side of the first pawl and a second side corresponding to the  
14 second guide side of the second pawl.

15 Further benefits and advantages of the present invention will  
16 become apparent after a careful reading of the detailed description with  
17 appropriate reference to the accompanying drawings.

#### 18 BRIEF DESCRIPTION OF THE DRAWINGS

19 Fig. 1 is an exploded perspective view of a operating device for  
20 a screwdriver in accordance with the present invention;

21 Fig. 2 is a cross sectional side plan view of the operating device  
22 for a screwdriver of the present invention;

23 Fig. 3 is a first operational top plan view of the operating device

1 in Fig. 2;

2 Fig. 4 is a second operational top plan view of the operating  
3 device in Fig. 2;

4 Fig. 5 is a third operational top plan view of the operating  
5 device in Fig. 2;

6 Fig. 6 is a schematic view of the operating device in Fig. 2  
7 showing the operating device secured on a handle of the screwdriver;

8 Fig. 7 is an exploded perspective view of a operating device for  
9 a screwdriver in accordance with the prior art; and

10 Fig 8 is a cross sectional side plan view of a ratchet screwdriver  
11 in accordance with the prior art.

## 12 DETAILED DESCRIPTION OF THE INVENTION

13 Referring to the drawings and initially to Figs. 1-3, a operating  
14 device for a screwdriver in accordance with the present invention  
15 comprises a body (1) adapted to be partially secured in a handle (4) of  
16 the screwdriver, a barrel (2) partially and pivotally received in the body  
17 (1) and a controller (3) pivotally mounted on the body (1) for  
18 controlling an operated direction of the operating device.

19 The body (1) includes a first through hole (13) longitudinally  
20 and centrally defined in the body (1). The body (1) includes a column  
21 (11) adapted to be securely inserted into the handle of the screwdriver  
22 and a pivot seat (12) integrally formed with the column (11). The first  
23 through hole (13) has an enlarged portion (131) formed and

1 corresponding to the pivot seat (12). The pivot seat (12) has a first  
2 channel (121) and a second channel (122) respectively defined in the  
3 pivot seat (12) and corresponding to each other. The first channel (121)  
4 and the second channel (122) correspond to and communicate with the  
5 enlarged portion (131) of the through hole (13). A cutout (123) is  
6 defined in an outer periphery the pivot seat (12) and extending to a top  
7 of the pivot seat (12) between the first channel (121) and the second  
8 channel (122). A blind hole (124) is radially defined in the outer  
9 periphery of the pivot seat (12) and a first spring (125) is  
10 compressively received in the blind hole (124). A steel ball (126) is  
11 partially received in the blind hole (124) to compress the first spring  
12 (125).

13         The barrel (2) includes a polygonal hole (21) longitudinally  
14 defined in the barrel and centrally extending through the barrel (2). The  
15 barrel (2) has a first end extending through the first through hole (13)  
16 in the body (1) and a first annular groove (22) defined near the first end  
17 of the barrel (2). A first C-shaped ring (221) mounted on the first  
18 annular groove (22) after the first end of the barrel (2) extending  
19 through the body (10) to hold the barrel in place. A series of teeth (23)  
20 is formed on an outer periphery of the barrel (2) and corresponds to the  
21 enlarged portion (131) of the through hole (13) in the body (1). The  
22 series of teeth (23) has a diameter slightly smaller than that of the  
23 enlarged portion (131) of the through hole (13) such that the series of

1 teeth (23) is rotatably received in the enlarged portion (131) of the  
2 through hole (13) after the first end of the barrel (2) extending through  
3 the body (1). The barrel (2) includes a second end and a second annular  
4 groove (24) defined in the outer periphery of the barrel (2) between the  
5 second end of the barrel (2) and the series of teeth (23).

6       The controller (3) includes a first pawl (31) and a second pawl  
7 (32) respectively movably received in the first channel (121) and the  
8 second channel (122) in the pivot seat (12). The first pawl (31) and the  
9 second pawl (32) correspond to each other and are selectively engaged  
10 to the series of teeth (23) of the barrel (2) to control the operated  
11 direction of the barrel (2). The first pawl (31) has a first protrusion (311)  
12 longitudinally extending therefrom over the pivot seat (12). The first  
13 protrusion (311) has an inclined first guide side (312) formed thereon  
14 and facing the second pawl (32). The second pawl (32) has a second  
15 protrusion (321) extending therefrom over the pivot seat (12). The  
16 second protrusion (321) has an inclined second guide side (322)  
17 formed thereon and facing the first pawl (31). A second spring (33) is  
18 compressively mounted between the first pawl (31) and one side of the  
19 first channel (121), and a third spring (34) is compressively mounted  
20 between the second pawl (32) and one side of the second channel (122).  
21 The restitution force of the second spring (33) and the second spring  
22 (34) pushes the first pawl (31) and the second pawl (32) toward each  
23 other. A cover (35) is pivotally mounted around the pivot seat (12). The



1 cover (35) includes a skirt (351) mounted around the outer periphery of  
2 the pivot seat (12) and a shoulder (352) radically extending from one  
3 end of the skirt (351) opposite to the body (1) and defining a second  
4 through hole (353) to allow the barrel (2) extending through the cover  
5 (35). A second C-shaped ring (350) is mounted one the second annular  
6 groove (24) to hold the cover (35) in place after the barrel (2)  
7 extending through the cover (35). The cover (35) has a first recess (354)  
8 defined in the shoulder (352) for receiving the first protrusion (311) of  
9 the first pawl (31) and a second recess (355) defined in the shoulder  
10 (352) for receiving the second protrusion (321) of the second pawl (32).  
11 A clutch (356) is securely attached to the shoulder (352) between the  
12 first recess (354) and the second recess (355) for driving the first pawl  
13 (31) and the second pawl (32) to selectively engage to the series of  
14 teeth (23). The width of the clutch (356) is gradually enlarged relative  
15 to the barrel (2). The clutch (356) has a first side (3561) corresponding  
16 to the first guide side (312) and a second side (3562) corresponding to  
17 the second guide side (322). The cover (35) includes a stopper (357)  
18 extending from the shoulder (352) and slidably received in the cutout  
19 (123) in the pivot seat (12) to limit the rotating range of the cover (35).  
20 A first indentation (358), a second indentation (359) and a third  
21 indentation (360) are defined in an inner periphery of the skirt (351) to  
22 partially receive the steel ball (126) for user to easily control the  
23 rotating range of the cover (35).

1           With reference to Fig. 3, the first side (3561) and the second  
2 side (3562) respectively about the first guide side (312) and the second  
3 guide side (322), the first pawl (31) and the second pawl (32) are  
4 respectively engaged to the series of teeth (23) and the steel (126) is  
5 partially received in the first indentation (358). Consequently, the  
6 screwdriver is used as a conventional screwdriver without operating  
7 device.

8           With reference to Fig. 4, the second pawl (32) is disengaged  
9 from the series of teeth (23) when the cover (35) is rotated toward the  
10 second pawl (32), the clutch (356) outwardly pushes the second pawl  
11 (32), the second guide side (322) is moved along the second side (3562)  
12 and the steel ball (126) is partially received in the second indentation  
13 (359). Consequently, the barrel (2) is only rotated along the arrow as  
14 shown in Fig. 4 and cannot be rotated back because the first pawl (31)  
15 abuts against the periphery of the first channel (121). The first pawl (32)  
16 is slightly pushed back relative to the skirt (351) and compresses the  
17 second spring (33) so that the first pawl always abuts the series of teeth  
18 (23) of the barrel (2) due to the restitution force of the second spring  
19 (33).

20           With reference to Fig. 5, the first pawl (31) is disengaged from  
21 the series of teeth (23) when the cover (35) is rotated toward the first  
22 pawl (31), the clutch (356) outwardly pushes the first pawl (31), the  
23 first guide side (312) is moved along the first side (3561) and the steel

1 ball (126) is partially received in the third indentation (360).  
2 Consequently, the barrel (2) is only rotated along the arrow as shown in  
3 Fig. 5 and cannot be rotated back because the second pawl (31) abuts  
4 against the periphery of the second channel (122). The second pawl (31)  
5 is slightly pushed back relative to the skirt (351) and compresses the  
6 third spring (34) so that the second pawl (32) always abuts the series of  
7 teeth (23) of the barrel (2) due to the restitution force of the third spring  
8 (34).

9           With reference to Figs. 1 and 6, the series of teeth (12) in  
10 accordance with the present invention is formed on the outer periphery  
11 of the barrel (2) so that the polygonal hole (21) is easily longitudinally  
12 defined in and extending through the barrel to receive a long tip and the  
13 switch for controlling the operating device is disposed near the top of  
14 the handle (4) of the screwdriver. Consequently, the operating device in  
15 accordance with the present invention is a convenient design for user to  
16 operate with a long tip and easily change the operate direction of the  
17 screwdriver on which the operating device of the present invention is  
18 mounted.

19           Although the invention has been explained in relation to its  
20 preferred embodiment, it is to be understood that many other possible  
21 modifications and variations can be made without departing from the  
22 spirit and scope of the invention as hereinafter claimed.